



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

Memorandum

Subject: Annual Monitoring Network Plans

From: Matthew Lakin, Manager
Air Quality Analysis Office, Air Division, Region 9

To: Region 9 Air Pollution Control Agencies

EPA first required submission of Annual Monitoring Network Plans in 2007. The plans require each agency to evaluate its existing network and discuss upcoming changes, and also allow the public and EPA to understand the monitoring network. To assist state and local agencies in meeting this new requirement, EPA Region 9 issued an "Annual Monitoring Network Plan for 2007" memo outlining the information that was required to be submitted as part of the annual plans. Since that time, EPA Region IX has reviewed over 100 annual network plans and has observed some widespread opportunities for improvements. In addition, there have been several changes to the monitoring requirements detailed in 40 CFR Part 58. This memo includes clarifications to pre-existing plan elements in an effort to promote consistent and thorough plans and also provides updated information reflecting changes in regulation since 2007, and clarifications on pre-existing plan elements.

We recognize that this memo is being sent only a few months before plans are due, and that agencies typically produce plans well ahead of July 1st in order to provide time for internal review and public notice and comment. We thank you for the time and attention paid each year when you develop these documents. We hope that you will be able to address the elements noted in this memo in your plans submitted this year, and will expect that all elements will be addressed in plans submitted in 2013.

The following bulleted list includes those elements that we have observed inconsistency in network plans. Please review the list, along with supporting materials as needed, to ensure that these elements are included in a way that is consistent with EPA requirements. In preparing your Annual Monitoring Network Plan, we encourage you to pay particular attention to the following plan elements:

- **Minimum Monitoring Requirements.** Agencies should provide the information detailed in Attachment A to this memo, including information on design values and CBSAs/MSAs.
- **Basic Site Information:** The network plans should include a description of each site and the purpose for monitoring each pollutant.

Comment [KH1]: I thought we decided in the meeting with Matt and Charlotte to steer clear of any language that pointed out deficiencies. (deleted)

Comment [GY2]: I was actually confused and thought that you were talking about 40 CFR 58 appendices. I think it'd be clearer if we call ours "Attachments."

Comment [KH3]: Actually this is more consistent w guidance on how to write memos (they have attachments....letters have enclosures)

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Comment [KH4]: Added these since I took off the detailed site table. Am not opinionated on keeping since it is nice to have this but is not as direct a requirement as the other things we are mentioning

Comment [D5]: MK: Statement of purpose of site is required per 58.10(a)(1). Recommend putting back in but not in the table itself – preserve formatting of previous template.

- **Maps and Photographs:** EPA encourages the use of a map or maps in the network plan to help describe the geographic distribution of each type of monitor throughout the jurisdiction, as well as photographs of each site to provide visual siting information.
- **PM_{2.5} Collocation.** Network plans should contain information on how collocation requirements are being met. See Attachment ~~FB~~ to this memo for an explanation of collocation requirements- PM_{2.5} information.
- **Detailed Site and Monitor Information tables.** While all network plans include site and monitor information tables, agencies should ensure that all required information is provided. We recommend using the template provided as Attachment ~~B-C~~ to this memo, which is an updated version of the table included in the template with the 2007 memo. Specific examples of required information include:
 - Monitoring objective, site type, monitor type, method code, parameter code and POC for each monitor (see Attachment ~~C-D~~ for descriptions).
 - Sampling Frequency for PM_{2.5} and PM₁₀ sites. Sampling frequencies should be determined in accordance with 40 CFR 58. For easy reference, Attachments ~~D-E~~ and ~~E-F~~ to this memo describe how sampling frequency should be determined.
 - ~~Collocation. Network plans should contain information on how collocation requirements are being met. See Attachment F to this memo for an explanation of collocation requirements- PM_{2.5} information.~~ When filling out the detailed site and monitor information tables (e.g., Attachment ~~B-C~~ to this memo), please ensure that your PM_{2.5} information is correct. This includes clearly identifying method code, FEM/FRM/non-FEM/non-FRM status, which monitors are being used to meet collocation requirements (see Attachment ~~FB~~), and whether data are comparable to the NAAQS.
- **Non-regulatory PM_{2.5} Monitors.** If an FRM or FEM monitor is designated as not comparable to the NAAQS (specified by a non-regulatory monitor type in AQS), justification should be given for the choice of monitor type (see Attachment H to this memo for guidance on this topic).

As noted above, there have been several changes to monitoring requirements since EPA Region 9's memo from 2007 that may require modifications to annual network plans. The specific requirements as of August 2011 are attached as Attachment ~~GH~~, "CFR Elements." General changes include new:

- NCore requirements (stations operational by January 1, 2011).
- Pb requirements: source-oriented (1.0 tpy or greater – monitors operational by January 1, 2010; 0.50 tpy – monitors by December 27, 2011), airport study monitors (by December 27, 2011), at urban NCore stations (population of 500,000 or greater – by January 1, 2012).
- SO₂ requirements: number of required monitors is based on the Population Weighted Emissions Index (PWEI) (operational by January 1, 2013).
- NO₂ requirements (address in July 1, 2012 plan).
- CO requirements: in CBSAs of 2.5 million persons or more (address in July 1, 2014 plan); other CO monitors (address in July 1, 2016 plan).

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Comment [D6]: This is a strange attachment and I think should just be trimmed and inserted here.

Attachments

Attachments A through ~~H-G~~ to this memo outline requirements and provide clarification on specific plan elements that ~~are not always addressed to the desired level of detail~~ may be improved. Attachments A, B and BC provide suggested table formats for State and local agencies to use when reporting minimum monitoring requirements, collocation requirements, and detailed site and monitor information, respectively. Although agencies are not required to include the exact tables included in these attachments, their use ensures that all relevant information is being included, as well as standardizing how plans present information. Regardless of how the information is presented, agencies must ensure that their network plans include all required information. Attachments C-D through H provide reference material that helps in assembling this information.

Attachment A provides suggested table templates for agencies to report minimum monitoring requirements and design values for each of the criteria pollutants. This information is similar the information that was provided in 2007 but with some additions and clarifications as described in the Attachment.

~~Attachment FB provides suggested table templates for collocation requirements and discusses~~ describes collocation requirements for PM₁₀, PM_{2.5}, and Pb. This is a new table.

Attachment B-C provides a suggested template for detailed site and monitor specific information to be reported. This table is similar to the one provided in the template with the 2007 memo but has been updated to reflect new/improved information.

Attachment C-D ~~discusses the process of selecting~~ provides a reference sheet for monitoring objectives, site types, monitor types, method and parameter codes for each monitor.

Attachment D-E ~~discusses outlines~~ sampling frequency requirements for manual PM_{2.5}.

Attachment E-F ~~discusses outlines~~ sampling frequency requirements for PM₁₀.

~~Attachment F discusses collocation requirements for PM₁₀, PM_{2.5}, and Pb.~~

Attachment G provides the regulatory basis for the Annual Monitoring Network Plan. Agencies are also encouraged to include additional information that describes their ambient air monitoring network.

~~Attachment H provides references to EPA guidance on operating and reporting data from continuous PM_{2.5} samplers.~~

Comment [D7]: MK: Any information that is intended to be a template needs to be in Times New Roman since this is what the original template was in. Although I like the look of the more modern fonts, I want agencies to be able to cut/paste as easily as possible.

General Network Plan Overview

Submittal date: States must submit an annual network plan on July 1st of each year (beginning in 2007) to the Regional Administrator. State and local agencies should provide a copy of the submittal to the Air Quality Analysis Office Manager.

Public Inspection/Comment: The annual monitoring network plan must be made available for public inspection (website, hardcopy posting in libraries and public offices, and/or newspaper listing) for at least 30 days prior to submission to EPA. ~~Although not required, EPA recommends soliciting comments concurrent with the public inspection period. Evidence of public inspection must be submitted.~~ If an opportunity for public comment had been provided, comments received must be included in the annual network plan submission.

Types of Monitors to include in plan: Include establishment and maintenance of an air quality surveillance system that consists of the following:

1. State or Local Air Monitoring Stations (SLAMS).
2. Federal Reference Method (FRM).
3. Federal Equivalent Method (FEM).
4. Approved Regional Method (ARM).
5. National Core Multipollutant Monitoring Stations (NCORE).
6. Speciation Trends Network (STN).
7. Photochemical Assessment Monitoring Stations (PAMS).
8. Special Purpose Monitor (SPM).

Network modifications: A network plan that proposes SLAMS network modifications including new monitoring sites is subject to the approval of the EPA Regional Administrator according to 40 CFR 58.14. If you are requesting approval for modifications as part of your network plan, please include a demonstration of how the criteria in 40 CFR 58.14 have been met.

We look forward to your network plan submittals. Please contact me, Matthew Lakin, at (415) 972-3851 or lakin.matthew@epa.gov, or any of my monitoring team staff, should you have any questions.

Comment [KH8]: Do we even want to broach the topic that if they don't allow solicit public comment we have to as part of our approval process? I'm guessing that this is why they all choose to do it on their own...

ATTACHMENT A

This attachment includes sample tables that can be incorporated into the annual monitoring network plan to display how an agency is assessing and meeting the minimum monitoring requirements for each of the criteria pollutants. EPA recommends that agencies designate a single section in their network plan that provides the analyses of minimum monitoring requirements for their jurisdiction. Within this section of the network plan, in addition to the tables included below, agencies are encouraged to include a general statement that briefly summarizes which minimum monitoring requirements are, and which are not being met. It is also good for agencies to note that in some cases although the regulation may already be in place, monitoring requirements may not come into play until after the date the submitted network plan is intended to cover (e.g. CO near-road monitoring does not come into effect until 2015 and 2017 according to 40 CFR 58.13(e)).

Ozone

(Note: Refer to section 4.1 and Table D-2 of Appendix D to 40 CFR Part 58)

Table 1. Minimum Monitoring Requirements for Ozone.

MSA	County(ies)	Population (year)	8-hr Design Value [ppb], DV Years ¹	Design Value site (name, AQS ID)	# Required Monitors	# Active Monitors	# Additional Monitors Needed

¹DV Years = the three years over which the design value (DV) was calculated (e.g., 2008-2010)

Monitors required for SIP or Maintenance Plan:

PM_{2.5}

(Note: Refer to sections 4.7.1, 4.7.2 and Table D-5 of Appendix D to 40 CFR Part 58)

Table 2a. Minimum Monitoring Requirements for PM_{2.5} SLAMS. (FRM/FEM/ARM, see 40CFR 58 App D Section 4.7.1 and Table D-5)

MSA	County(ies)	Population (year)	Annual Design Value [µg/m ³], DV years, DV site (name, AQS ID)	Daily Design Value[µg/m ³], DV years, DV site (name, AQS ID)	# Required SLAMS Monitors	# Active SLAMS Monitors	# Additional SLAMS Monitors Needed

Table 2b. Minimum Monitoring Requirements for continuous PM_{2.5} monitors. (FEM/ARM and non-FEM, see 40CFR 58 App D Section 4.7.2)

MSA	County(ies)	Population (year)	Annual Design Value [µg/m ³], DV years,	Daily Design Value[µg/m ³], DV years,	# Required Continuous Monitors	# Active Continuous Monitors	# Additional Continuous Monitors
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Comment [GY1]: I assume we have some idea of what a standard Table 1 would be, but since we don't mention it anywhere, I think it makes sense to start the numbering at "1" for this attachment.

Comment [GY2]: ? If this means something specific and they are required to use the base year for calculations, include a footnote explaining what it is.

Comment [GY3]: Suggest switching these columns, so that the # monitors required/needed comes before the # monitors active. Don't have to though.

Comment [GY4]: I think this is intended to cut down on the # of columns. But I think it makes sense to keep the two in separate columns, if we can swing it.

Comment [GY5]: KATE: Okay, I don't know how to edit this. I pasted in your old tables and added some edits/comments.

			DV site (name, AQS ID)	DV site (name, AQS ID)			Needed

¹DV Years = the three years over which the design value (DV) was calculated (e.g., 2008-2010)

Monitors required for SIP or Maintenance Plan:

[Background and Transport sites required per 40 CFR 58, App. D 4.7.3:](#)

PM₁₀

(Note: Refer to section 4.6 and Table D-4 of Appendix D to 40 CFR Part 58)

Table 3. Minimum Monitoring Requirements for PM₁₀.

MSA	County(ies)	Population (year)	Design Concentration* [µg/m ³], DV Years	Design Concentration* site (name, AQS ID)	# Expected Exceedances (years)	# Required Monitors	# Active Monitors	# Additional Monitors Needed

*see Section 6.3 of the *PM₁₀ SIP Development Guideline* (EPA-450/2-86-001): <http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P10061KV.txt>

Monitors required for SIP or Maintenance Plan:

NO₂

(Note: Refer to section 4.3 of Appendix D to 40 CFR Part 58)

Table 4. Minimum Monitoring Requirements for NO₂.

CBSA	Population (base year)	Max AADT counts (year)	# Near-road Monitors [Required:Active]	# Area-wide Monitors [Required:Active]	Monitors Needed [Near-road:Area-wide]	Annual Design Value [ppb], DV Years	Annual Design Value site (name, AQS ID)	1-hour Design Value [ppb] (years)	1-hour Design Value site (name, AQS ID)

Monitors required for SIP or Maintenance Plan:

Monitors required for PAMS:

[EPA Regional Administrator](#) Required monitors per 40 CFR 58, App. D 4.3.4:

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Comment [GY6]: Kate - did you add this? Do we need this?

Comment [KH7]: No – did not add. I don't think we should do this since it is a state-wide requirement. Also, it is more of a detailed site info thing since it is a site type that they have to assign.

Good thing to note on the checklist tho – that we need to make sure that there is one regional background and one regional transport sites somewhere in all the plans for a state.

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Comment [KH8]: I think this is pretty confusing and if we aren't using it for other pollutants – should be consistent

Comment [GY9]: Elfego - not sure how you want to do this, but I think it could use some clarification. I think my recommendation would be to separate this into two tables – could put the # monitors stuff in the first table (and have separate column for each the required/active/needed), and put the DV info in a second table.

Comment [KH10]: I would have two tables – one to address each of the three requirements (w/ a column each for required, active and needed.) – or could leave as one if you remove DV's

Comment [KH11]: Why are DV's in the table? I thought the tables were only supposed to reflect info needed to determine min # required monitors.

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SO₂

(Note: Refer to section 4.4 of Appendix D to 40 CFR Part 58)

Table 5. Minimum Monitoring Requirements for SO₂.

CBSA	County(ies)	Population (year)	Total SO ₂ ¹ [tons/year]	Population Weighted Emissions Index ² [million persons-tons per year]	# Required Monitors	# Active Monitors	# Additional Monitors Needed

¹Using NEI data

²Calculated by multiplying CBSA population and total SO₂ and dividing product by one million

Monitors required for SIP or Maintenance Plan:

EPA Regional Administrator-required monitors per 40 CFR 58, App. D 4.4.3:

CO

(Note: Refer to section 4.2 of Appendix D to 40 CFR Part 58)

Table 6. Minimum Monitoring Requirements for CO.

CBSA	Population (year)	# Required Near- Road Monitors	# Active Near-Road Monitors	# Additional Monitors Needed	8-hour Design Value [ppb], DV Years	8-hour Design Value site (name, AQS ID)	1-hour Design Value [ppb] (years)	1-hour Design Value site (name, AQS ID)

Comment [KH12]: See my comment #11

Monitors required for SIP or Maintenance Plan:

EPA Regional Administrator-required monitors per 40 CFR 58, App.D 4.2.2:

Pb

(Note: Refer to section 4.5 of Appendix D to 40 CFR Part 58)

Table 7a. Minimum Monitoring Requirements for Pb.

NCore Pb Monitoring

NCore Site (name, AQS ID)	CBSA	Population (year)	# Required Monitors	# Active Monitors	# Additional Monitors
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					Needed

Table 7b. Source-Oriented Pb Monitoring (including airports)

Source Name	Address	Pb Emissions (tons per year)	Emission Inventory Source & Data Year	Max 3-Month Design Value* [µg/m³]	Design Value date (third month, year)	# Required Monitors	# Active Monitors	# Additional Monitors Needed

*consider data from the past 3 years.

Monitors required for SIP or Maintenance Plan:
EPA Regional Administrator-required monitors per 40 CFR 58, App. D 4.5(c):

Why are DV's in the table? I thought the tables were only supposed to reflect info needed to determine min # required monitors.

Maybe just struck me odd that they are at far left of the table instead of before the # monitors needed part

While I agree it would be nice to have Design Values for everything (and nice to have a lot of other things) I thought we weren't asking for things that went beyond determining requirements were met

ATTACHMENT B

This attachment displays a suggested table format for agencies to use to report in their annual monitoring network plan all of the detailed site and monitor specific information for each of the stations in their monitoring network (as required per 40 CFR Part 58.10).

[Give a broad overview of the site and rationale for its location. Include a description of site and purpose of monitoring for each pollutant. A photograph of the site is encouraged but not required.]

Comment [D1]: MK: This needs to be Times New Roman. This template needs to be formatted as close to the old format as possible to allow agencies to easily match the old/new. There needs to be a very compelling reason to change formatting at this stage. Related to this, the following needs to precede it, as it did in the previous template:
[Give a broad overview of the site and rationale for its location. Include a description of site and purpose of monitoring for each pollutant. A photograph of the site is encouraged but not required.]
Note that this is required under 58.10(a)(1) in the first paragraph.

Local site name	Sample Site	
AQS ID (XX-XXX-XXXX)	12-345-6789	
GPS coordinates (decimal degrees)	37.785381, 122.398047	
Street Address	75 Hawthorne Street, San Francisco, CA 94105	
County	San Francisco	
Distance to roadways (meters)	36	
Traffic count (AADT, year)	15,000 (2010)	
Groundcover (e.g. asphalt, dirt, sand, etc.)	Asphalt	
Representative statistical area name (e.g. MSA, CBSA, etc.)	SAN FRANCISCO-OAKLAND-FREMONT Metro Area	
Pollutant, POC	Ozone, 1	PM _{2.5} , 3
Parameter code ¹	44201	88101
Basic monitoring objective(s) ²	NAAQS	NAAQS, research
Site type(s) ³	MAX OZONE	QUALITY ASSURANCE
Monitor type(s) ⁴	SLAMS/PAMS	QA COLLOCATED
Instrument manufacturer and model	2B Technologies 202	Andersen RAAS2.5-200
Method code ⁵	190	128
FRM/FEM/ARM/other	FEM	FRM
Spatial scale (e.g. micro, neighborhood, etc.) ⁶	Urban	Neighborhood
Monitoring start date (MM/DD/YYYY)	01/01/2006	01/01/1999
Sampling frequency (e.g. 1:3, continuous, etc.)	continuous	1:3
Sampling season (MM/DD-MM/DD)	01/01-12/31	01/01-12/31
Probe height (meters)	5.3	5.2
Distance from supporting structure (meters)	2.2	2.1
Distance from obstructions on roof (meters)	N/A	N/A
Distance from obstructions not on roof (meters)	25	29
Distance from trees (meters)	35	39
Distance to furnace or incinerator flue (meters)	13	15
Distance between collocated monitors (meters)	N/A	3
Unrestricted airflow (degrees)	360	360
Probe material for reactive gases (e.g. Pyrex, stainless steel, etc.)	Teflon	N/A
Residence time for reactive gases (seconds)	6	N/A
Will there be changes within the next 18 months? (Y/N)	N	Y
Is it suitable for comparison against the annual PM _{2.5} ? (Y/N)	N/A	Y
Frequency of flow rate verification for manual PM samplers ⁷	N/A	monthly
Frequency of flow rate verification for automated PM analyzers ⁷	N/A	N/A
Frequency of one-point QC check for gaseous instruments ⁷	bi-weekly	N/A
Last Annual Performance Evaluation for gaseous parameters (MM/DD/YYYY)	02/28/2012	N/A

¹ Parameter codes may be found at <http://www.epa.gov/ttn/airs/airsaqs/manuals/codedescs.htm>

² Monitoring objectives: public info, NAAQS comparison, research.

³ Site types: extreme downwind, highest conc., max ozone conc., max precursor impact, population exposure, source oriented, upwind background, general/background, regional transport, welfare-related impacts, quality assurance, other.

⁴ Monitor types: IMPROVE, index site, industrial, NATTS, NCORE, non-EPA Federal, PAMS, proposed NCORE, QA Collocated, SLAMS, special purpose, supplemental speciation, trends speciation, tribal monitors, unofficial PAMS.

⁵ Method codes may be found at <http://www.epa.gov/ttn/airs/airsaqs/manuals/codedescs.htm>

⁶ Spatial scales: micro, middle, neighborhood, urban, regional, national, global. See Table D-1 of 40CFR58 App. D for appropriate siting scales for various site types.

⁷ e.g. weekly, bi-weekly, monthly, etc

Last two semi-annual flow rate audits for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	07/12/2011; 01/15/2012
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Attachment C:

Agencies must select one or more descriptors from each the following categories for every monitor they operate: basic monitoring objectives, site type (referred to as monitoring objective types in AQS), monitor type, method code and parameter code. Since many of these parameters are related to each other, an Agency should choose a set of these descriptors that is consistent. This information is required for reporting data to AQS and should be included in the Annual Network Plan.

Basic Monitoring Objectives (40 CFR 58 App. D 1.1)
(a) Provide air pollution data to public in a timely manner
(b) NAAQS comparison
(c) Research support

Acceptable AQS Coding for Site Types (40 CFR 58 App. D 1.1.1)
EXTREME DOWNWIND
HIGHEST CONCENTRATION
MAX OZONE CONCENTRATION
MAX PRECURSOR EMISSIONS IMPACT
POPULATION EXPOSURE
SOURCE ORIENTED
UPWIND BACKGROUND
GENERAL/BACKGROUND
REGIONAL TRANSPORT
WELFARE RELATED IMPACTS
QUALITY ASSURANCE
OTHER
Site types (monitoring objective types) can be found in the AQS coding manual (Section 5.4.8) at: http://www.epa.gov/ttn/airs/airsaqs/manuals/AQS%20Data%20Coding%20Manual.pdf

Acceptable AQS Coding for Monitor Types
IMPROVE
INDEX SITE
INDUSTRIAL
NATTS
NON-EPA FEDERAL
NON-REGULATORY
PAMS
PROPOSED NCORE
QA COLLOCATED
SLAMS
SPECIAL PURPOSE
SUPLMNTL SPECIATION
TRENDS SPECIATION
TRIBAL MONITORS
UNOFFICIAL PAMS
Monitor types can be found at: http://www.epa.gov/ttn/airs/airsaqs/manuals/codedescs.htm

Method Codes

Method codes can be found at: <http://www.epa.gov/ttn/airs/airsaqs/manuals/codedescs.htm> (see Protocols w/ Sampling Methodology).

Descriptions of FRM/FEM designations at <http://www.epa.gov/ttn/amtic/criteria.html> are also useful in selecting the appropriate method code.

Parameter Codes

Parameter codes can be found at: <http://www.epa.gov/ttn/airs/airsaqs/manuals/codedescs.htm> (see Pollutant Codes).

Attachment D

The following information outlines the appropriate sampling frequency for required PM_{2.5} SLAMS described in 40 CFR 58.12(d). The sampling frequency of each PM_{2.5} monitor should be included in the detailed site information section of an Agency's Annual Network Plan (see Attachment B of this memo for a template which includes this information).

1. Manual PM_{2.5} FRMs at required SLAMS are required to operate at a 1-in-3 day schedule
2. Agencies may request approval from the Regional Administrator for a reduction to a 1-in-6 day schedule for manual FRMs at required SLAMS stations which also have a continuous monitor operating.
3. The 1-in-3 day schedule must be retained for the following required sites:
 - a. A required SLAMS that determine an area's design value and are within \pm 10 percent of either the annual or the 24-hour NAAQS.
 - b. Any required site that exceeded the 24-hour NAAQS at one or more times a year for three years.
4. An increase in frequency to a daily sampling schedule is required for required SLAMS that determine an area's design value and are within \pm 5 percent of either the annual or the 24-hour NAAQS.

Attachment E

This attachment clarifies how and when to determine the appropriate sampling frequency for PM₁₀ samplers required by 40 CFR 58.12(e). The sampling frequency of each PM₁₀ monitor should be included in the detailed site information section of an Agency's Annual Network Plan (see Attachment B of this memo for a template which includes this information).

With respect to sampling frequency for PM₁₀, 40 CFR 58.12(e) states (emphasis added):

For PM₁₀ samplers, a 24-hour sample must be taken from midnight to midnight (local standard time) to ensure national consistency. The minimum monitoring schedule for the site in the area of expected maximum concentration shall be based on the relative level of that monitoring site concentration with respect to the 24-hour standard as illustrated in Figure 1. If the operating agency demonstrates by monitoring data that during certain periods of the year conditions preclude violation of the PM₁₀24-hour standard, the increased sampling frequency for those periods or seasons may be exempted by the Regional Administrator and permitted to revert back to once in six days. The minimum sampling schedule for all other sites in the area remains once every six days. No less frequently than as part of each 5-year network assessment, the most recent year of data must be considered to estimate the air quality status at the site near the area of maximum concentration. Statistical models such as analysis of concentration frequency distributions as described in "Guideline for the Interpretation of Ozone Air Quality Standards," EPA-450/479-003, U.S. Environmental Protection Agency, Research Triangle Park, NC, January 1979, should be used. Adjustments to the monitoring schedule must be made on the basis of the 5-year network assessment. The site having the highest concentration in the most current year must be given first consideration when selecting the site for the more frequent sampling schedule. Other factors such as major change in sources of PM₁₀ emissions or in sampling site characteristics could influence the location of the expected maximum concentration site. Also, the use of the most recent 3 years of data might, in some cases, be justified in order to provide a more representative database from which to estimate current air quality status and to provide stability to the network. This multiyear consideration reduces the possibility of an anomalous year biasing a site selected for accelerated sampling. If the maximum concentration site based on the most current year is not selected for the more frequent operating schedule, documentation of the justification for selection of an alternative site must be submitted to the Regional Office for approval during the 5-year network assessment process. Minimum data completeness criteria, number of years of data and sampling frequency for judging attainment of the NAAQS are discussed in appendix K of part 50 of this chapter.

EPA interprets the "relative level of that monitoring site concentration" language in 40 CFR 58.12(e) to mean the design concentrations as defined in Section 6.3 of the *PM₁₀ SIP Development Guideline* (EPA-450/2-86-001). Figure 1 below is Table 6.1 of this guidance and describes how to choose a "design concentration", which is based on the number of daily samples available for the three year period. Figure 2 below is a modified version of Figure 1 from 40 CFR 58.12(e) is included below, in which the bracketed values are the design concentration bounds that should be used to determine PM₁₀ sampling frequency.

For example, if the sampler is operating on a 1 in 6 day schedule, the "design concentration" would be the highest value in that dataset. This would then be compared to the design value concentrations that correspond to the ratios to the standard (see Figure 2) to determine the required sampling frequency.

Figure 1: Table 6.1 from the *PM₁₀ SIP Development Guideline* (EPA-450/2-86-001).

TABLE 6-1

TABULAR ESTIMATION OF PM₁₀ DESIGN CONCENTRATIONS

Number of Daily Values	Rank of Upper Bound	Rank of Lower Bound	Data Point Used for Design Concentration
≤ 347	-	1	Highest Value
348 - 695	1	2	Second Highest Value
696 - 1042	2	3	Third Highest Value
1043 - 1096	3	4	Fourth Highest Value

Figure 2: A modified version of Figure 1 from 40 CFR 58.12(e) which includes design value concentrations that correspond to the ratios to the standard. (Ratios are calculated using the 24 hour standard, $150 \mu\text{g}/\text{m}^3$, and rounded to the nearest $10 \mu\text{g}/\text{m}^3$).

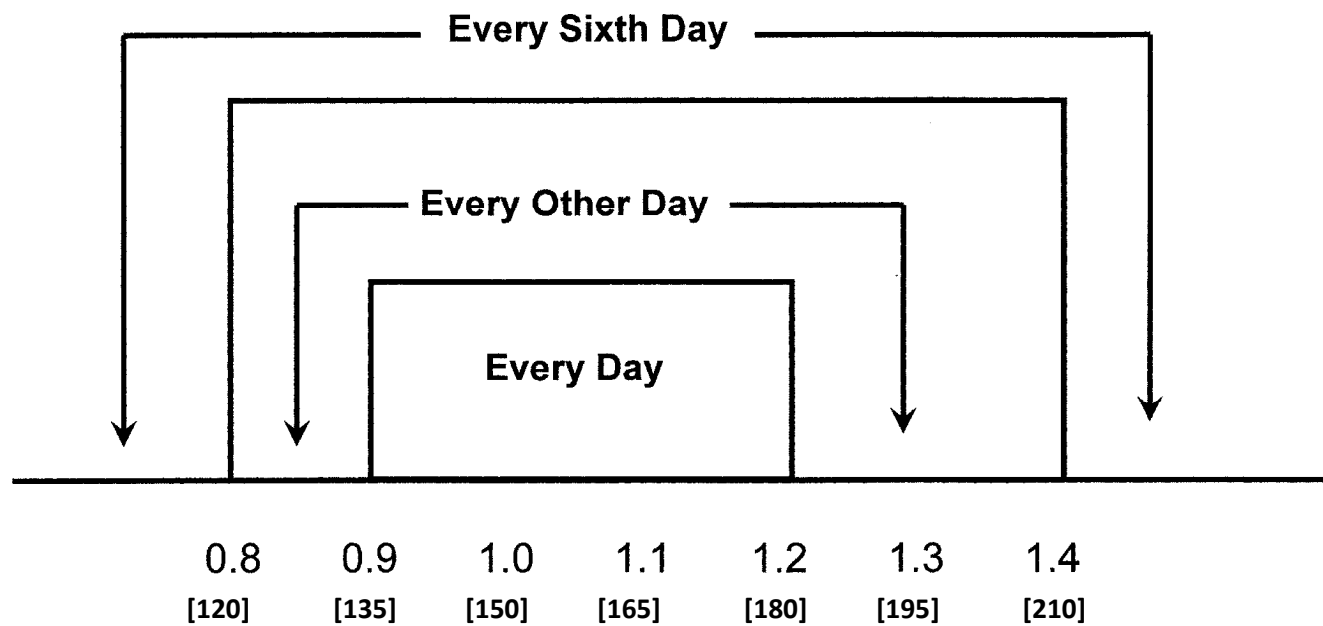


Figure 1 – Ratio to Standard

ATTACHMENT F

This attachment clarifies the SLAMS collocation requirements for PM_{2.5}, PM₁₀, and Pb at the Primary Quality Assurance Organization (PQAO) level required by 40 CFR 58 Appendix A, Section 3. Note that collocation requirements for non-source oriented NCore Pb sites are handled at the national level and not at the PQAO level. Collocated monitors should be identified (including their sampling frequency) in the detailed site information section of an Agency's Annual Network Plan (see Attachment B of this memo for a template which includes this information).

PM_{2.5} Collocation as described in 40 CFR 58 Appendix A, Sections 3.2.5 & 3.3.5

- Look at your PM_{2.5} monitoring network. Group your primary monitors by method designation – specifically, by each FRM method, and by each FEM method. The following applies to your primary monitoring network, on a method basis.
- For **each FRM method** designated (considering primary monitors only):
 - Collocate at 15 percent of monitors (values of 0.5 or greater round up)
 - Must have at least one collocated monitor per PQAO
 - Collocated monitor must be same FRM method designation as the primary monitor.
- For **each FEM method** designated (considering primary monitors only):
 - Collocate at 15 percent of monitors (values of 0.5 or greater round up).
 - The first collocated monitor must be an FRM.
 - Half of collocated monitors must be FRMs, and half must be the same FEM method as the primary monitor.
 - If an odd number of collocated monitors are required, the additional monitor must be a FRM.
- Collocated FRM samplers are required to run on a 12-day sampling frequency.
- 80 percent of the collocated samplers should be located at sites that have DVs within ± 20 percent of either the annual or 24-hour PM_{2.5} NAAQS.
- If an agency has no sites within ± 20 percent of either the annual or 24-hour PM_{2.5} NAAQS, 60 percent of the collocated monitors should be located at sites with annual mean concentrations among the 25 percent highest in the network.
- PM_{2.5} samplers used in the PM_{10-2.5} network may be counted to fulfill collocation requirements as long as the samplers are of the same method designation (from 40 CFR 58 Appendix A, Section 3.3.5).

Comment [GY1]: So, this changed a bit from your version to this latest version. I just pasted yours in, and then edited a bit. Take a look and see what you think.

Comment [GY2]: minimum? Could they do more frequent?

Comment [GY3]: I added this, but is it actually correct?

PM₁₀ Collocation as described in 40 CFR 58 Appendix A, Section 3.3.1

- Only manual PM₁₀ samplers qualify for collocation.
- Each method of manual PM₁₀ samplers must have 15 percent (or at least one) of the monitors collocated.
- Collocation for TSP and PM₁₀ samplers must be considered separately.

- PM₁₀ samplers used in the PM_{10-2.5} network may be counted to fulfill collocation requirements as long as the samplers are of the same method designation.
- Collocated sites must be within the highest 25 percent annual mean concentrations, unless alternatives are approved by the Regional Administrator.
- Collocated PM₁₀ samplers are to run on a 12-day schedule.

Comment [GY4]: Kate - Elfego added some info here. I assume it's all correct...

Pb Collocation as described in 40 CFR 58 Appendix A, Section 3.3.4.3

- PQAOs with only non-source-oriented NCore Pb sites do not have PQAQ minimum collocation requirements. EPA is responsible for coordinating the national collocation requirements that do exist for this network and are established based on 40 CFR Appendix A, Section 3.2.6. Should EPA coordinate with a PQAQ to assist with national Pb network collocation, then the collocated monitor must be of the same method designation as the primary monitor.
- All other PQAQs must implement collocation requirements for Pb following PM₁₀ collocation described above (and in 40 CFR 58 Appendix A, Section 3.3.1) with the exception that the first collocated Pb site selected must be the site measuring the highest Pb concentrations in the network.

ATTACHMENT G

This appendix lists the Annual Monitoring Network Plan Regulatory elements discussed in 40 CFR Part 58 as of August 21, 2011. Refer to the official, most recent 40 CFR Part 58 every year as new modifications are regularly incorporated.

40 CFR 58.10 states:

(a)(1) Beginning July 1, 2007, the State, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN stations, State speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA.

(2) Any annual monitoring network plan that proposes SLAMS network modifications including new monitoring sites is subject to the approval of the EPA Regional Administrator, who shall provide opportunity for public comment and shall approve or disapprove the plan and schedule within 120 days. If the State or local agency has already provided a public comment opportunity on its plan and has made no changes subsequent to that comment opportunity, and has submitted the received comments together with the plan, the Regional Administrator is not required to provide a separate opportunity for comment.

(3) The plan for establishing required NCore multipollutant stations shall be submitted to the Administrator not later than July 1, 2009. The plan shall provide for all required stations to be operational by January 1, 2011.

(4) A plan for establishing source-oriented Pb monitoring sites in accordance with the requirements of appendix D to this part for Pb sources emitting 1.0 tpy or greater shall be submitted to the EPA Regional Administrator no later than July 1, 2009, as part of the annual network plan required in paragraph (a)(1) of this section. The plan shall provide for the required source-oriented Pb monitoring sites for Pb sources emitting 1.0 tpy or greater to be operational by January 1, 2010. A plan for establishing source-oriented Pb monitoring sites in accordance with the requirements of appendix D to this part for Pb sources emitting equal to or greater than 0.50 tpy but less than 1.0 tpy shall be submitted to the EPA Regional Administrator no later than July 1, 2011. The plan shall provide for the required source-oriented Pb monitoring sites for Pb sources emitting equal to or greater than 0.50 tpy but less than 1.0 tpy to be operational by December 27, 2011.

(5) A plan for establishing NO₂ monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the Administrator by July 1, 2012. The plan shall provide for all required monitoring stations to be operational by January 1, 2013.

(6) A plan for establishing SO₂ monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the EPA Regional Administrator by July 1, 2011 as part of the annual network plan required in paragraph (a) (1). The plan shall provide for all required SO₂ monitoring sites to be operational by January 1, 2013.

(7) A plan for establishing CO monitoring sites in accordance with the requirements of appendix D to this part shall be submitted to the EPA Regional Administrator. Plans for required CO monitors shall be submitted at least six months prior to the date such monitors must be established as required by section 58.13.

With respect to CO monitoring network completion, 40 CFR 58.13(e) states that “CO monitors required under Appendix D, section 4.2 of this part must be physically established and operating under all of the requirements of this part, including the requirements of appendices A, C, D, and E to this part, no later than: (1) January 1, 2015 for

CO monitors in CBSAs having 2.5 million persons or more; or (2) January 1, 2017 for other CO monitors”. This means that a plan for CO monitoring sites due for operation on January 1, 2015, is due to EPA on July 1, 2014 and a plan for CO monitoring sites due for operation on January 1, 2017, is due to EPA on July 1, 2016.

The remainder of Part 58.10 continues:

(b) The annual monitoring network plan must contain the following information for each existing and proposed site:

(1) The AQS site identification number.

(2) The location, including street address and geographical coordinates.

(3) The sampling and analysis method(s) for each measured parameter.

(4) The operating schedules for each monitor.

(5) Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal.

(6) The monitoring objective and spatial scale of representativeness for each monitor as defined in appendix D to this part.

(7) The identification of any sites that are suitable and sites that are not suitable for comparison against the annual $PM_{2.5}$ NAAQS as described in §58.30.

(8) The MSA, CBSA, CSA or other area represented by the monitor.

(9) The designation of any Pb monitors as either source-oriented or non-source-oriented according to Appendix D to 40 CFR part 58.

(10) Any source-oriented monitors for which a waiver has been requested or granted by the EPA Regional Administrator as allowed for under paragraph 4.5(a)(ii) of Appendix D to 40 CFR part 58.

(11) Any source-oriented or non-source-oriented site for which a waiver has been requested or granted by the EPA Regional Administrator for the use of Pb- PM_{10} monitoring in lieu of Pb-TSP monitoring as allowed for under paragraph 2.10 of Appendix C to 40 CFR part 58.

(12) The identification of required NO_2 monitors as either near-road or area-wide sites in accordance with appendix D, section 4.3 of this part.

(c) The annual monitoring network plan must document how States and local agencies provide for the review of changes to a $PM_{2.5}$ monitoring network that impact the location of a violating $PM_{2.5}$ monitor or the creation/change to a community monitoring zone, including a description of the proposed use of spatial averaging for purposes of making comparisons to the annual $PM_{2.5}$ NAAQS as set forth in appendix N to part 50 of this chapter. The affected State or local agency must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan.

(d) The State, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in appendix D to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma), and, for

any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby States and Tribes or health effects studies. For PM_{2.5}, the assessment also must identify needed changes to population-oriented sites. The State, or where applicable local, agency must submit a copy of this 5-year assessment, along with a revised annual network plan, to the Regional Administrator. The first assessment is due July 1, 2010.

(e) All proposed additions and discontinuations of SLAMS monitors in annual monitoring network plans and periodic network assessments are subject to approval according to §58.14.

Per 40 CFR 58.10(a)(1), agencies must provide “evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E” to 40 CFR 58, where applicable. EPA recommends the expanded list of information below to be included in the network plan to provide evidence of compliance with this requirement. From each of the 40 CFR 58 Appendices, include the following:

Appendix A

- Were Precision/Accuracy reports submitted to AQS for data year covered by the plan?
- Was an annual data certification package submitted for the data year covered by the plan?
- What was the frequency of flow rate verification for manual PM sampler audits?
- What was the frequency of flow rate verification for automated PM analyzer audits?
- What was the frequency of one-point QC checks for gaseous instruments?
- When was the last Annual Performance Evaluation conducted for gaseous instruments?
- When were the last two semi-annual flow rate audits for manual and automated PM monitors?
- When did PEP audits occur during the data year covered by the plan?
- When did NPAP audits occur during the data year covered by the plan?

Appendix C

- What is the instrument manufacturer and model used for each monitor?
- What is the start date of each monitor?

Appendix D

- What is the sampling season for each parameter?
- Does the network meet minimum number of monitors required?
 - For each pollutant consider MSA, population, design value, # required, # operating.
 - May include a map displaying the location of monitoring sites.

Appendix E

- For each site:
 - What is the distance from nearest road in meters?
 - What is the traffic count of nearest road?
 - What is the surrounding groundcover (e.g. paved, vegetated, gravel, etc.)?
- For each monitor:
 - What is the probe height in meters?
 - If there is one, what is the distance from the nearest supporting structure in meters?
 - If there is one, what is the distance from the nearest obstruction on the roof in meters?
 - If there is one, what is the distance from the nearest obstruction not on the roof in meters?
 - What is the nearest distance from an obstructive tree in meters?
 - If there is one, what is the distance from the nearest furnace or incinerator flue in meters?
 - If there is one, what is the distance between collocated monitors?
 - What is the unrestricted airflow in degrees?
 - What is the probe material for reactive gases (i.e. O₃, NO₂, and SO₂)?
 - For reactive gases, what is the residence time at NCore and NO₂ sites?

ATTACHMENT H

This attachment lists existing EPA guidance on operating and reporting data from continuous PM_{2.5} monitors.

Memo dated July 24, 2008:

This memo describes how to integrate continuous FEM and ARM methods into a SLAMS network, including discussions of appropriate method evaluation periods and data usage. If operating FEMs that are considered non-regulatory, agencies should include a justification in the Annual Network Plan.

“Implementing Continuous PM_{2.5} Federal Equivalent Methods (FEMs) and Approved Regional Methods (ARMs) in State or Local Air Monitoring Station (SLAMS) Networks.”

<http://www.epa.gov/ttn/amtic/files/ambient/pm25/femarmslam.pdf>

Memo dated June 1, 2006:

The following memo outlines how to report continuous PM_{2.5} data to AQS, including parameter codes for both FEMs and non-FEMs. The parameter codes should be included in the Annual Network Plan. Documentation justifying the choice of parameter code should also be included for the choice of 88501 vs. 88502 for non-FEM data, as well as the choice of a parameter code other than 88101 for FEMs.

“Technical Note on Reporting PM_{2.5} Continuous Monitoring and Speciation Data to the Air Quality System (AQS).”

<http://www.epa.gov/ttn/amtic/files/ambient/pm25/datamang/contrept.pdf>